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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,753	08/31/2000	Sonti Venkata Ramakrishna	U 012932-5	3517

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EXAMINER

PADMANABHAN, KARTIC

ART UNIT PAPER NUMBER

1641

DATE MAILED: 06/17/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/652,753	RAMAKRISHNA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kartic Padmanabhan	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 06 May 2003.
- 2a) This action is FINAL.                  2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 20-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 20-36 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)           | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . | 6) <input type="checkbox"/> Other: _____ .                                   |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20, 26, 28, 30-34, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Ramakrishna et al. (US Pat. 6,420,146). The reference discloses a process for the preparation of stable yeast crystals. According to the invention, yeast is grown by inoculation in media that was sterilized at 121 degrees Celsius after the pH had been adjusted to 6.8-7.2 using 1 N sodium chloride or 1 N hydrochloric acid. This was then incubated on a shaker at 26-30 degrees Celsius for about 24 hours with aeration. The yeast was then separated by centrifugation at 5,000-15,000 rpm for 10 minutes at 24-32 degrees Celsius. A yeast slurry was then prepared by mixing the yeast 0.5-10% with 0.5-3% natural polymer solution. The immobilized yeast beads were then prepared by adding this solution dropwise into a curing solution of 0.05-0.3 M calcium chloride solution. The beads were kept in this solution overnight at a temperature of 4 degrees Celsius. The immobilized yeast beads were then separated by decanting the solution and washed with distilled water several times. The beads were then dehydrated at a temperature of 24-36 degrees Celsius for 2-20 hours to obtain stable yeast crystals having a moisture content of 5-30%. These crystals were activated by incubation in 5-8% molasses solution for 2-48 hours at 24-32 degrees

Celsius. The yeast crystals were then separated by draining this aqueous solution (Col. 4, lines 8-53). Sodium alginate 2% was generally used in preparing the yeast slurry (Col. 4, lines 64).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 24-25, 27, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishna et al. (US Pat. 6,420,146).

The reference teaches methods for the preparation of stable yeast crystals, as previously discussed. However, the reference does not teach the specific components of the media, a specific aeration rate, glucose as the activation solution, or the specific normality of solutions used to adjust pH.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use the specific media of the pending claims, as well as an aeration of 5 ml/minute and glucose as activation solution. The selection of these parameters merely represents an optimization of the assay protocol and do not patentably distinguish the claimed invention over the prior art of record. One of skill in the art would easily be capable of selecting parameters, such as media and aeration rate that promote yeast growth. In addition, one could have also substituted glucose solution for the molasses solution of the reference with a reasonable expectation that the same intended result would be achieved, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Further, the reference discloses the use of 1 N solutions to adjust pH, as opposed to 0.1 N as claimed. However, it would have been obvious to use 0.1 N solutions with the invention of the reference because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In this case, the use of a less concentrated solution allows for the concentration of the media to be adjusted at a more gradual rate than if using a more concentrated solution, with the selection of the preferred concentration well within the skill of those in the art.

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7. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishna et al. (US Pat. 6,420,146) as applied to claims 20, 24-28, and 30-36 above, and further in view of Yuan (US Pat. 6,153,416).

Ramakrishna et al. teach methods for the preparation of stable yeast crystals, as previously discussed. However, the reference does not teach selecting a culture from activated sludge.

Yuan teaches the immobilization of microbial cells in polymeric beads. The process of the reference can be used effectively to immobilize yeast, as well as activated sludge microorganisms and waste water treatment microorganisms (Col. 2, line 63 – Col. 3, line 5).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use the microbial consortia obtained from wastewater treatment plants as taught by Yuan with the method of Ramakrishna et al. because Yuan teaches that both yeast and waste water microorganisms can be used for immobilization onto beads. Therefore, one could have substituted wastewater microorganisms for the yeast in Ramakrishna et al. with a reasonable expectation of success.

8. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramakrishna et al. (US Pat. 6,420,146) as applied to claims 20, 24-28, and 30-36 above, and further in view of Husain et al. (US Pat. 6,361,695).

Ramakrishna et al. teach methods for the preparation of stable yeast crystals, as previously discussed. However, the reference does not teach the termination of growth at an MLSS of 14,500-15,500 mg/liter.

Husain et al. teach a wastewater treatment system wherein when the MLSS reaches levels of 15 g/l (15,000 mg/liter), some of the mixed liquor is removed from the bioreactor. The MLSS levels must be below this level for effective effluent treatment.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to use the MLSS levels of Husain et al. with the method of Ramakrishna et al. because after an MLSS of 15,000 mg/liter has been reached, optimal conditions for effluent treatment and growth of microbes no longer exist.

***Double Patenting***

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 20, 24-28, and 30-36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,420,146. Although the conflicting claims are not identical, they are not patentably distinct from each other because the steps involved in the methods of the two sets of claims are very similar in scope, thus rendering the claims not patentably distinct. For detailed reasons of the similarities between the sets of claims, applicant is directed to the rejections over Ramakrishna et al. under 35 USC 102 and 35 USC 103. Although these rejections do not specifically address the claims in the '146 patent, the claims closely resemble the part of the disclosure applied in the rejections.

11. Claims 21-23 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,420,146 in view of Yuan (US Pat. 6,153,416). The '146 patent teaches the basic method of the claimed invention, but fails to teach the selection of microbial consortia from wastewater treatment plants or activated sludge, a deficiency that is remedied by Yuan, as discussed under 35 USC 103.

12. Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,420,146 in view of Husain et al. (US Pat. 6,361,695). The '146 patent teaches the basic method of the claimed invention, but fails to teach the specific range of MLSS of the claimed invention, a deficiency that is remedied by Husain et al., as discussed under 35 USC 103.

***Response to Arguments***

13. Applicant's arguments filed May 6, 2003 have been fully considered but they are not persuasive.

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14. Applicant's argues that the claims require the culturing of aerobic materials, thereby rendering the use of yeast as in US Pat. 6,420,146 inapplicable to the present invention and the reference improperly applied under 35 USC 102. This is not found convincing. Read broadly, the claim merely requires the culturing of a microbe that can live and/or grow in the presence of oxygen. Since the reference teaches the culturing of yeast with aeration (in the presence of air containing oxygen), the reference is deemed sufficient to meet this claim limitation. Further, applicant has not defined the term "active aerobic microbial consortia" in any way in the specification, nor has applicant provided representative examples of what they mean by this terminology, thereby not limiting the term to the definition advocated by applicants.

15. In response to applicant's argument that the claims teach the use of granules in BOD analysis, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

16. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., BOD analysis in 2 hours) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

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17. Applicant's arguments that the combination of Ramakrishna et al. and Yuan et al. is improper because Yuan teaches away from the invention are not convincing. Although Yuan may indeed state that natural immobilization techniques may provide less than optimal results, the reference does not state that these techniques would not work. Although they contemplate the use of other immobilization techniques, the reference does not rule out the use of natural techniques. Further, it is noted that Yuan, as a secondary reference, is *only* relied upon for the teaching of selecting a culture from activated sludge, as the immobilization technique of the present invention is already taught by Ramakrishna et al. as the primary reference.

18. Applicant argues that Husain is inapplicable to the present invention because the reference is limited to shipboard waste water treatment systems. However, applicant has not provided any rationale or evidentiary support for this position, which renders it *prima facie* unconvincing. The examiner maintains that since Ramakrishna et al. and Husain et al. both deal with waste water treatment, Husain does indeed provide guidance in the field of the invention of Ramakrishna et al., and the references are properly combined as the basis of a 103 rejection.

19. Applicant's arguments regarding the obviousness type double patenting rejections are unconvincing for reasons discussed above in reference to the prior art rejections. Applicant's arguments that there is no basis for applying the Yuan or Husain references under obviousness double patenting rejections due to the lack of a common inventor and/or assignees are *clearly erroneous*. Yuan and Husain are only being applied as secondary references under the obviousness type double patenting rejections, with Ramakrishna et al. as the primary references. As such, these references are only relied upon for teaching certain limitations of the dependent claims of the present invention and do not require a relationship with the present application.

When filing a terminal disclaimer, applicant need only disclaim the terminal portion of the Ramakrishna et al. patent.

***Conclusion***

Claims 20-36 are rejected.

References: Sublette et al. and Baba et al. are cited as art of interest for teaching methods and/or particles for waster water treatment.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kartic Padmanabhan whose telephone number is 703-305-0509. The examiner can normally be reached on M-F (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 703-305-3399. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-746-5207 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Kartic Padmanabhan  
Patent Examiner  
Art Unit 1641

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June 13, 2003



LONG V. LE  
SUPERVISORY PATENT EXAMINER  
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06/14/03